

REMARKS

I. Status of the Application

Claims 1-10, 17-20 and 24-27 are pending in this application. In the April 14, 2004 office action, the Examiner:

1. Withdrew claims 7-9 from further consideration as being drawing to a nonelected species, and there allegedly being no allowable generic or linking claim;
2. Allowed claims 18-20;
3. Rejected claims 1-3 and 10 under the judicially created doctrine of obviousness-type double patenting, over claims 1-3 and 10 of U.S. Patent No. 6,304,447 in view of U.S. Patent No. 5,991,153 to Heady et al. (hereinafter “Heady”);
4. Rejected claims 4-5 under the judicially created doctrine of obviousness-type double patenting, over claims 1-3 and 10 of U.S. Patent No. 6,304,447 in view of Heady, in further view of U.S. Patent 4,684,328 to Murphy et al. (hereinafter “Murphy”);
5. Rejected claims 1, 3 and 10 under 35 U.S.C. § 102(e) as allegedly being anticipated by Heady.
6. Rejected claim 2 under 35 U.S.C. § 103(a) as allegedly being obvious over Heady in view of U.S. Patent No. 4,302,793 to Rohner (hereinafter “Rohner”);
7. Rejected claims 4-5 under 35 U.S.C. § 103(a) as allegedly being obvious over Heady in view of Rohner in further view of Murphy;
8. Objected to claim 6 as allegedly being a substantial duplicate of claim 18; and
9. Objected claim 3 for informalities.

In this response, applicants have cancelled claim 2 without prejudice. Applicants have amended claim 1 such that claim 1 effectively represents claim 2 as previously presented. Applicants have also amended claim 3 to address an inadvertent typographical error. Applicants respectfully traverse the rejections of claims 1-5 and 10, the objection to claim 6, and to the renewed withdrawal of claims 7-9 from reconsideration.

II. The Double Patenting Rejection of Claims 1-3 and 10 Should be Withdrawn

In the April 14, 2004 office action, the Examiner rejected claims 1-3 and 10 under the judicially created doctrine of obviousness-type double patenting. In particular, the Examiner stated that claims 1-3 and 10 were obvious over claims 1-3 and 10 of U.S. Patent No. 6,304,447 in view of Heady.

Applicants respectfully traverse. It is respectfully submitted that the Examiner has failed to allege a prima facie case of obviousness-type double patenting because the Examiner has mischaracterized the teachings of Heady. Thus, the premise underlying the Examiner's allegation of motivation or suggestion to combine is in error.

In particular, the Examiner's reasoning for the double patenting rejection is set forth below:

The [6,304,447] patent claims all the claimed limitations of the application except an electromechanical actuator.

Heady et al discloses an electronic assembly comprising a substrate 220 with components 245; and a circulating fluid via electromechanical actuator 150 for the purpose of improving heat exchange.

....
It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ in the patent an electromechanical actuator for

the purpose of improving heat exchange as recognized by Heady et al.
(April 14, 2004 office action at p.3)

It is respectfully submitted that, like Wickelmeier in prior office actions, Heady does not disclose “a circulating fluid via electromechanical actuator”, as alleged by the Examiner. Heady discloses a fan 150 that circulates *air*, not liquid. There does not appear to be any teaching in the art that the fan of Heady is suitable for use in liquids. Furthermore, fans designed for air cooling purposes are generally not suitable for circulating liquids.

Accordingly, the double-patenting obviousness rejection is based on an incorrect premise that Heady teaches fluid circulation using an electromechanical actuator. Specifically, 1) Heady neither suggests nor implies *fluid* circulation at all, and 2) the actuator employed by Heady is unsuitable for use in a liquid. Also, claim 1 has to the extent that the Examiner alleges that air is a fluid, it is noted that claim 1 has been amended to positively recite a liquid. Thus, not only has the Examiner failed to allege a legally sufficient motivation or suggestion to combine, there simply is no motivation or suggestion to combine such incompatible technologies.

Therefore, one of ordinary skill in the art would *not* use the electromechanical actuator (i.e. the fan 150) of Heady to move the liquid of claims 1-3 and 10 of U.S. Patent No. 6,304,447. As a consequence, it is respectfully submitted that the obviousness-type double patenting rejection of claims 1-3 and 10 should be withdrawn.

III. The Double Patenting Rejection of Claims 4 and 5 Should be Withdrawn

The Examiner also rejected claims 4 and 5 under the judicially created doctrine of obviousness-type double patenting. In particular, the Examiner stated that claims 4 and 5 were obvious over claims 1-3 and 10 of U.S. Patent No. 6,304,447 in view of Heady, in further view of Murphy.

The Examiner's rejection is based on the underlying combination of U.S. Patent No. 6,304,447 and Heady using the same reasoning as that applied in the rejection of claims 1-3 and 10. As discussed above, however, there is no motivation or suggestion to combine the teachings of claims 1-3 and 10 of U.S. Patent No. 6,304,447 and Heady as proposed by the Examiner. Accordingly, for at least the same reasons as those set forth above in connection with claims 1-3 and 10, it is respectfully submitted that the obviousness-type double patenting rejection of claims 4-5 should be withdrawn.

Moreover, the Examiner states that it "would have been obvious . . . to employ in the patent a piezoelectric actuator for the purposes of optimizing space and power requirements as recognized by Murphy et al." However, the '447 Patent does not use any actuator, and thus implementing a piezoelectric actuator would actually be less optimal both space-wise and power-wise.

However, it is appreciated that the Examiner is alleging that one of ordinary skill would have the initial motivation to place the fans of Heady into the device of the '447 Patent and then replace the fans with a piezoelectric actuator. As discussed above, one would not modify the '447 Patent with the fans of Heady in the first place, because the fans are inappropriate for the environment of the Patent. In other words, there can be no

motivation to replace fans with piezoelectric actuators for power and space savings when no device having a fan exists.

For these reasons it is respectfully submitted that the rejection of claims 4-5 over claims 1-3 and 10 of U.S. Patent no. 6,304,447 in view of Heady and in further view of Murphy should be withdrawn.

IV. The Anticipation Rejection Should be Withdrawn

The Examiner rejected claims 1, 3 and 10 as allegedly being anticipated by Heady. Claim 1 has been amended to incorporate the limitations of claim 2. The Examiner has admitted that claim 2 is not anticipated by Heady. (See April 14, 2004 Office Action at pp.4-5). Accordingly, it is respectfully submitted that the anticipation rejection of claim 1 is moot and should be withdrawn.

Claims 3 and 10 both depend from and incorporate all of the limitations of claim 1. Accordingly, for at least the same reasons as those set forth in connection with claim 1, it is respectfully submitted that the anticipation rejection of claims 3 and 10 should be withdrawn.

V. Claim 2 (now claim 1), is Not Obvious Over the Proposed Combination of Heady and Rohner

In the April 14, 2004 office action, the Examiner rejected claim 2 as allegedly being obvious over Heady in view of Rohner. Claim 1 represents claim 2 in independent form. Applicants respectfully traverse the rejection. As will be discussed in further detail below, there is no motivation or suggestion to combine the teachings of Heady and

Rohner as proposed by the Examiner. Indeed, to the extent there is *any* motivation or suggestion to combine Heady and Rohner, the resulting combination would *not* arrive at the invention. Specifically, Rohner teaches away from the proposed combination and towards a combination that does not arrive at the claimed invention.

The Examiner's reasoning for the obviousness rejection of claim 2 (now claim 1) over Heady in view of Rohner is set forth below:

Heady et al discloses all the claimed limitations except liquid as the working fluid.

Rohner discloses an electronic assembly comprising a substrate 12 with components 10; and a circulating liquid 44 pump 32 for the purpose of improving heat exchange.

Since Heady et al and Rohner are both from the same field of endeavor and/or analogous art, the purpose disclosed by Rohner would have been recognized in the pertinent art of Heady et al.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ in Heady et al a circulating liquid for the purpose of improving heat exchange as recognized by Rohner.

(April 14, 2004 office action at p.5).

A. The Rejection of Claim 2 (Now claim 1)

In the above-quoted excerpt of the Office Action, the Examiner appears to allege that the fan 150 of Heady constitutes an electromechanical actuator disposed within an enclosure member. The Examiner further appears to further allege that Rohner teaches use of a liquid or fluid, and that one would be motivated to use the liquid of Rohner with the structure of Heady.

Applicants submit that even if Rohner provided the suggestion to use a circulating fluid in the Heady device, Rohner teaches the use of such a circulating liquid *with an external pump*, not with an internal fan such as that shown in Heady. In other words,

even assuming Rohner teaches that liquid cooling provides improved heat exchange as alleged by the Examiner, such a teaching does *not* suggest simply placing liquid in the fan-driven air-cooled system of Heady. At best, Rohner teaches wholesale replacement of the air-cooled *system* of Heady with the liquid-cooled *system* of Rohner.

Replacing the air-cooled system of Heady with the liquid-cooled system Rohner would not result in the use of an electromechanical actuator secured within the compartment as called for in claim 1 as amended. In particular, the liquid-cooled system of Rohner employs an *external* pump. (See Rohner, Fig. 1, element 32). Thus, any modification of Heady that is suggested by Rohner would necessarily involve the replacement of the fans 140 and 150 of Heady with the external pump 32 of Rohner.

Such a combination would *not* arrive at an invention that includes the step of “at least one electromechanical actuator secured within the compartment, at least a portion of the at least one electromechanical actuator disposed over the at least one aperture” as called for in claim 1. As a consequence, there is no motivation or suggestion to combine Heady and Rohner *in the manner proposed by the Examiner*.

Further to this point, Rohner teaches away from retaining a fan from an air-cooled system when the air-cooled system is replaced with a fluid-cooled system. In particular, Rohner teaches an improvement over an air-cooled fan system that *replaces* the fan-based air-cooled system with a liquid-cooled system that includes an external pump. This liquid-cooled system does not retain the fan of the air-cooled system. (See Rohner at col. 1, lines 14-18, lines 29-32, lines 36-39 and lines 47-59; element 32 of Fig. 1). Thus, Rohner appears to teach away from a liquid-cooled system that uses a fan to move the

liquid within the system.

For the foregoing reasons, it is respectfully submitted that no motivation or suggestion exists to modify Heady by replacing the cooling air with cooling liquid while keeping the internally-located fan. Any modification of Heady suggested by Rohner, to the extent there is any, would also involve replacement of the fan of Heady with the *external* pump of Rohner. Such a modification of Heady would not arrive at the invention of claim 1. As a consequence, the obviousness rejection of claim 2 (now claim 1) that is based on Heady and Rohner is in error and should be withdrawn.

VI. Claims 4 and 5

Claims 4 and 5 depend from and incorporate all of the limitations of claim 1 as amended. Claims 4 and 5 stand rejected over Heady in view of Rohner in further view of Murphy. As discussed above, there is no motivation or suggest to combine Heady and Rohner in a manner that arrives at the invention of claim 1. Murphy does not cure this deficiency of Heady and Rohner with respect to claim 1. Accordingly, for at least the same reasons as those set forth above in connection with claim 1, it is respectfully submitted that the obviousness rejection of claims 4 and 5 that is based on Heady, Rohner and Murphy is in error and should be withdrawn.

VII. The Objection to Claim 6 is in Error

The Examiner objected to claim 6 as allegedly being a substantial duplicate of claim 18. Claim 6 is not a substantial duplicate of claim 18. Claim 6 includes the

limitation "the substantially rigid blade extends from the piezoelectric actuator in the direction of the at least one aperture". No such limitation is found in claim 18. Claim 6 clearly has a different scope than claim 18 as written.

For at least this reason, it is respectfully submitted that the objection to claim 6 is in error and should be withdrawn.

VIII. The Objection to Claim 3 is Moot

The Examiner objected to claim 3 as allegedly containing an informality. Applicants have amended claim 3 to remove the informality. Accordingly, it is respectfully submitted that the objection to claim 3 is moot and should be withdrawn.

IX. Conclusion

For all of the foregoing reasons, it is respectfully submitted that the application is in a condition for allowance. Favorable reconsideration and allowance of this application is, therefore, earnestly solicited. In addition, because claims 7-9 all depend from a generic allowable claims, it is respectfully submitted that these claims be reinstated.

Respectfully Submitted,



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